ANALYTICAL RESULTS
OF SURFACE WATER SAMPLES
COLLECTED FROM RACCOON CREEK
April 27, 1999 Sampling Event

Prepared for:

Lyondell Chemicals Worldwide, Inc./Beazer East Inc.

Prepared by:

Applied Hydrology Associates
Pittsburgh, PA
Denver, Colorado

June 1, 1999

Applied
Hydrology
Associates, Inc.

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1.0 INTRODUCTION

This report presents the results of surface water samples collected from Raccoon Creek at the Lyondell Chemical Company (LCC) / Beazer East Inc. (BEI) Monaca, PA site during the April 27, 1999 quarterly monitoring event. The samples were collected in compliance with Appendix D of the 1997 Consent Order and Agreement (1997 CO&A) between ARCO Chemical Company[1], BEI and the Pennsylvania Department of Environmental Protection (PADEP) dated October 20, 1997.

2.0 SAMPLING

Surface water samples were collected at Transect E as defined in the 1997 CO&A. The location of Transect E is shown in Figure 1. In addition, water elevations were measured in nearby monitoring wells and the results are presented in Appendix A.

A total of eight surface water samples, including a duplicate were collected from Raccoon Creek on April 27, 1999. These samples were collected at the same three locations along Transect E as in previous sampling events. The locations are shown in Figure 2 and are at the center of the stream, and approximately 30 feet from the east and west banks. At the center location, samples were collected at three depths; 6 inches below the surface, 2 inches above the bottom, and midway between the surface and bottom. Samples from the east and west sides of the transect were collected at two depths; 2 inches above the bottom, and midway between the surface and bottom.

During sampling a boat was stationed at Transect E using a rope secured to the east and west shores of Raccoon Creek. The samples were collected by using a peristaltic pump to pump water from the desired depth into three 40-ml vials preserved with hydrochloric acid. Samples were collected from the required depths utilizing tubing secured to a vertical steel rod lowered from the boat until it rested on the bottom of the creek. The rod did not penetrate the sediments on the creek bottom because a 1-foot diameter disc constructed of steel mesh is fastened perpendicular to the bottom of the rod.

Two tubes were used. The bottom of the "deep sample tube" was secured to the probe 2 inches from the bottom of the probe. The bottom of the "mid-depth sample tube" is adjustable and was secured to the probe mid-depth at each location. Care was taken not to disturb the sediments at the sampling location and the pumped water was closely monitored to ensure sediment was not included in the sample. One gallon of water was pumped through the tubing before each sample was obtained in order to purge the tubing.

[1] ARCO Chemical Company is now Lyondell Chemicals Worldwide

The samples were uniquely numbered as follows to identify the location, depth and date of sampling:

RC-EC-00-0499

Where:

RC	indicates Raccoon Creek
EC	indicates Transect E and location (C = center, L = left bank, R = right bank [facing downstream])
00	indicates sample depth in feet and tenths of a foot (0.0 feet)
0499	indicates the month and year collected (April 1999)

Samples were logged onto a chain of custody form (included in of the data validation report in Appendix B) and stored on ice until receipt by Reliance Laboratories Inc. in Edison, NJ. Reliance analyzed the samples using USEPA Method 624 and 8260 for BTEXS.

3.0 RESULTS

The analytical results are presented in Table 1. None of the BTEXS constituents were detected in any of the eight samples. Sampling locations and depths are shown on Figure 2, along with the concentration of benzene at each location. Water levels in wells near Raccoon Creek are presented in Appendix A.

Table 1
Summary of Analytical Results for Samples Collected from Raccoon Creek

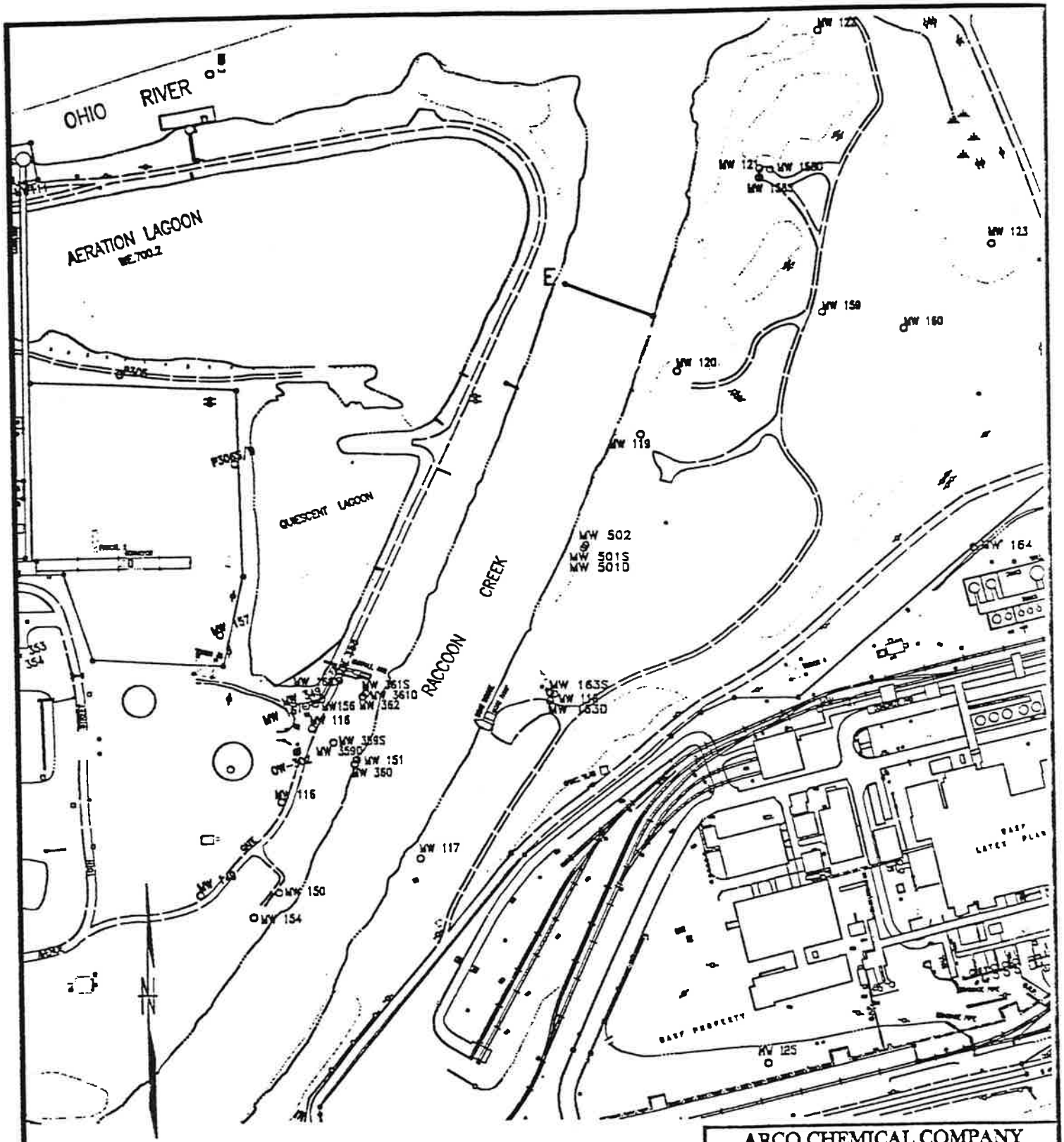
Sample Name	Benzene	Toluene	Ethylbenzene	Xylene	Styrene
RC-EL-24-0499	< 0.66	< 0.6	< 1.04	<1.04	< 0.92
RC-EL-48-0499	< 0.66	< 0.6	< 1.04	<1.04	< 0.92
RC-EC-00-0499	< 0.66	< 0.6	< 1.04	<1.04	< 0.92
RC-EC-00-0499A	< 0.66	< 0.6	< 1.04	<1.04	< 0.92
RC-EC-38-0499	< 0.66	< 0.6	< 1.04	<1.04	< 0.92
RC-EC-74-0499	< 0.66	< 0.6	< 1.04	<1.04	< 0.92
RC-ER-36-0499	< 0.66	< 0.6	< 1.04	<1.04	< 0.92
RC-ER-72-0499	< 0.66	< 0.6	< 1.04	<1.04	< 0.92

The analytical data were validated upon receipt and found to be acceptable. A Data Validation Report which includes the Certificate of Analysis is provided as Appendix B. Table 2 presents the historical concentration of benzene in Raccoon Creek at Transect E during all monitoring events to date.

Table 2
Historic Benzene Concentrations at Transect E
(ug/L)

Sampling Location	Sampling Depth	7/23/97	10/28/97	2/25/98	5/21/98	7/29/98	10/27/98	2/3/99	4/27/99
30 Feet off West Bank	Mid-depth	0.28	<0.13	<0.13	0.70	<0.13	1.57(1)	0.37	< 0.66
30 Feet off West Bank	Deep	0.81	<0.13	<0.13	0.70	<0.13	0.61(1)	0.49	< 0.66
Center of Creek	Shallow	0.24	<0.13	0.38	0.70	<0.13	<0.13	0.61(1)	< 0.66(1)
Center of Creek	Mid-Depth	0.18	<0.13	0.49	0.64	<0.13	0.2	0.64	< 0.66
Center of Creek	Deep	0.46	<0.13	0.30	0.60	<0.13	<0.13	0.69	< 0.66
30 Feet off East Bank	Mid-depth	0.16	<0.13	<0.13	<0.13	0.13	0.52	< 0.13	< 0.66
30 Feet off East Bank	Deep	<0.13	<0.13	0.14	0.22	0.22	<0.13	< 0.13	< 0.66

(1) Results shown are the average of the blind duplicate samples.

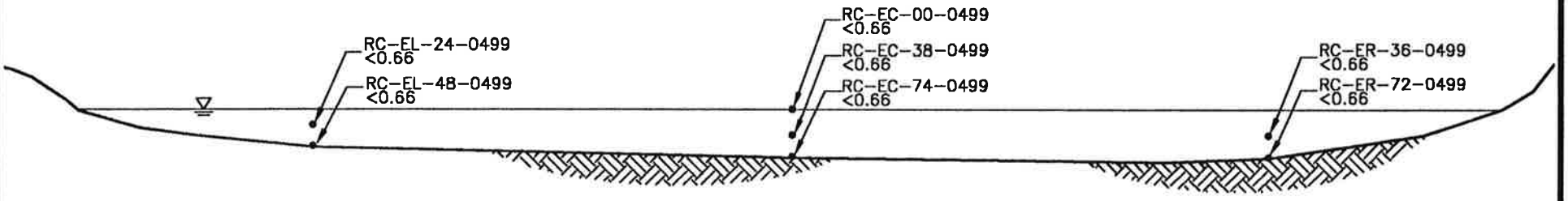


Applied Hydrology Associates, Inc.

ARCO CHEMICAL COMPANY
BEAVER VALLEY PROPERTY
RACCOON CREEK QUARTERLY MONITORING

FIGURE 1 TRANSECT AND MONITORING WELL LOCATIONS

SM	8/27/98	FILE REFERENCE: TRANSECT.DWG	
MJZ			
		36-5	



CREEK SECTION
LOOKING DOWNSTREAM

LEGEND

- SURFACE WATER SAMPLE LOCATION

ALL CONCENTRATIONS IN ug/L

20' 0 20'

SCALE IN FEET

Applied Hydrology Associates, Inc.

LYONDELL CHEMICAL COMPANY
BEAVER VALLEY PROPERTY
RACCOON CREEK QUARTERLY MONITORING

FIGURE 2

SURFACE WATER BENZENE CONCENTRATIONS AT TRANSECT 'E'

APRIL 27, 1999

DESIGN: SM	DATE: 8/27/98	FILE REFERENCE: BENZENE.dwg
DRAWN: JLS	SCALE: NOT TO SCALE	
CHECKED:	APPROVED:	PROJECT NO. 38-5 / PAGE NO.

Appendix A

Groundwater Elevations, East and West Sides of Raccoon Creek

GROUNDWATER LEVELS ON THE EAST AND WEST SIDES OF RACCOON CREEK
April 27, 1999

Well Number	Top of Casing (TOC) (ft. amsl)	Depth to SPL from TOC (2) (ft. amsl)	Depth to Water from TOC (2) (ft. amsl)	Calculated Water Level Elevation (1) (ft. amsl)	Calculated SPL Thickness (3) (ft. amsl)	Comments
Monitoring Wells Screened in Silty Clay Unit						
OTH AREA						
MW - 360	685.84	ND	2.11	683.73	N/A	
MW - 170	706.70	ND	22.30	684.40	N/A	
MW - 362	689.43	ND	5.53	683.90	N/A	
RACCOON CREEK AREA						
MW- 118	690.39	ND	5.79	684.60	N/A	
MW - 502	701.86	ND	18.14	683.72	N/A	
MW - 119	705.59	ND	21.86	683.73	N/A	
MW - 120	709.42	ND	25.68	683.74	N/A	
MW - 121	713.90	ND	30.17	683.73	N/A	
MW - 152	696.35	ND	12.66	683.69	N/A	
Monitoring Wells Screened in Upper Sand and Gravel Unit						
OTH AREA						
MW - 344	709.42	ND	25.41	684.01	N/A	
MW - 359S	692.93	ND	9.20	683.73	N/A	
MW - 361S	689.40	ND	5.79	683.61	N/A	
MW - 169	707.93	ND	23.60	684.33	N/A	
MW - 167	711.06	ND	27.32	683.74	N/A	Top of casing changed from 707.36 to 711.06 on 11/98 to accommodate respiration monitoring well head. Monitoring well stick up is 3.70 above orig. TOC
RACCOON CREEK AREA						
MW - 163S	690.87	ND	7.21	683.66	N/A	
MW - 501S	701.30	ND	17.86	683.44	N/A	
MW - 162S	706.05	ND	22.32	683.73	N/A	
MW - 159	708.99	ND	25.35	683.64	N/A	
MW - 160	701.00	ND	17.35	683.65	N/A	
MW - 158S	713.60	ND	29.98	683.62	N/A	
MW - 122	692.78	ND	9.19	683.59	N/A	
Note: See figure 1						
(1) Calculated values, based on Elevation of TOC minus Depth to Water from TOC.						
(2) Measured from top of casing using the MMA Interface Probe. ND means no SPL was detected.						
(3) Calculated values, based on Depth to Water from TOC minus Depth to SPL from TOC. N/A means not applicable, no SPL was detected.						

GROUNDWATER LEVELS ON THE EAST AND WEST SIDES OF RACCOON CREEK
April 27, 1999

Well Number	Top of Casing (TOC) (ft. amsl)	Depth to SPL from TOC (2) (ft. amsl)	Depth to Water from TOC (2) (ft. amsl)	Calculated Water Level Elevation (1) (ft. amsl)	Calculated SPL Thickness (3) (ft. amsl)	Comments
Monitoring Wells Screened in Lower Sand and Gravel Unit						
OTH AREA						
MW 345	708.91	ND	25.34	683.57	N/A	
MW 361D	689.35	ND	5.74	683.61	N/A	
MW 359D	692.80	ND	9.20	683.60	N/A	
RACCOON CREEK AREA			5.96			
MW 163D	689.62	ND	5.96	683.66	N/A	
MW 501D	701.44	ND	17.93	683.51	N/A	
MW 166D	703.95	ND	20.43	683.52	N/A	
MW 158D	712.04	ND	28.64	683.40	N/A	

Water Levels in Raccoon Creek and Ohio River				
RACCOON CREEK AREA STAFF GAUGE				
Time of Observation	**Staff Gauge Elevation (a) (ft. amsl)**	**Staff Gauge Reading**	**Calculated Water Level Elevation (ft. amsl)**	**Comments**
9:16	685.00	1.80	683.80	
12:31	685.00	1.60	683.60	
OHIO RIVER. STAFF GAUGE				
8:56	685.96	3.90	683.86	
12:24	685.96	3.65	683.61	
Note: See figure 1				

(1) Calculated values, based on Elevation of TOC minus Depth to Water from TOC.

(2) Measured from top of casing using the MMA Interface Probe. ND means no SPL was detected.

(3) Calculated values, based on Depth to Water from TOC minus Depth to SPL from TOC. N/A means not applicable, no SPL was detected.

(4) Elevation 685.00 is equivalent to 3.00 mark on staff gauge at Raccoon Creek

(5) Elevation 685.96 is equivalent to 6.00 mark on staff gauge at Ohio River

Appendix B

Data Validation Report

Applied
Hydrology
Associates, Inc.

1200 South Parker Road, Suite 100 Denver, CO 80231 Tel: (303) 873-0164 Fax: (303) 873-6110

M E M O R A N D U M

TO: **Files**
FROM: **Skip Meier, Applied Hydrology Associates**
DATE: **May 21, 1999**
SUBJECT: **Data Validation Results, Raccoon Creek Sampling**
Lyondell Chemical Company Beaver Valley Property

Data validation was performed on the volatile organic analytical data from eight surface water samples obtained from Raccoon Creek on April 27, 1999. The validation was performed in accordance with the "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review". Reliance Laboratories Inc. performed the analysis using EPA Method 624/8260. The samples reviewed included:

Field Sample ID	Lab Sample ID
RC-EL-24-0499	R-6228.2
RC-EL-48-0499	R-6228.4
RC-EC-00-0499	R-6228.7
RC-EC-00-0499A	R-6228.6
RC-EC-38-0499	R-6228.8
RC-EC-74-0499	R-6228.5
RC-ER-36-0499	R-6228.3
RC-ER-72-0499	R-6228.1
Field Blank	R-6228.9
Trip Blank	R-6228.10

Items reviewed and actions taken were as follows:

√ **Method:**
The nine samples were analyzed for BTEXS by method USEPA 634/8260 on April 29, 1999.

√ **Holding Time:**
All Samples were analyzed within the 14-day holding time.

√ **Blanks:**
No target compounds were detected in the associated method blank.

√ **System Monitoring Compounds:**
The "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" indicate that "Recoveries for system monitoring compounds in volatile samples and blanks

must be within the limits specified in the Method." However, Method 524.2 does not specify a required recovery. Nevertheless, 4-bromofluorobenzene and 1,2-dichlorobenzene-d4 surrogate recoveries were within 99-104 percent and this is acceptable.

√ **Internal Standards:**
All fluorobenzene internal standards were within the established criteria for area internal standard and retention time.

√ **GC/MS Instrument Performance Check:**
All bromofluorobenzene (BFB) tunes met the ion abundance criteria. Analysis of the instrument performance check solution was performed at the beginning of each 12-hr period during which the samples were analyzed.

√ **Initial Calibrations:**
The initial calibration performed on April 29, 1999 for Instrument HP5971A met the 30 percent relative standard deviation (RSD) and 0.05 minimum relative response factor criteria for all compounds.

√ **Continuing Calibrations:**
Continuing calibration was run and compared to the correct initial calibration. All continuing calibrations met the 25 percent difference and minimum relative response factor criteria for all compounds.

√ **Matrix Spike/Duplicate:**
The matrix spike/duplicate results for recovery and RPD were within the Quality Control limits.

√ **Target Compound Indentification/Quantitation:**
No problems were identified with compound identification or quantities.

√ **Field Duplicate:**
A field duplicate was collected during this sampling event. The duplicate sample was denoted by an "A" at the end of the sample name. The pair is RC-EC-00-0499 and duplicate RC-EC-00-0499A. Table 1 below summarizes the RPD for the sample/duplicate pair.

Table 1: Relative Percent Difference (RPD)

Sample Name	Benzene (ppb)	RPD (%)	Toluene (ppb)	RPD (%)	Ethyl-Benzene (ppb)	RPD (%)	Xylene (ppb)	RPD (%)	Styrene (ppb)	RPD (%)
RC-EC-00-0499	ND	NA	ND	NA	ND	NA	ND	NA	ND	NA
RC-EC-00-0499A	ND	NA	ND	NA	ND	NA	ND	NA	ND	NA

ND = Non Detect
NA = Not Applicable

√ **Summary:**
No inconsistencies were noted. No BTEXS constituents were detected in the duplicate sample pair RC-EC-00-0499 and RC-EC-00-0499A (See Table 1). No BTEXS compounds were detected in either the trip blank or the field blank.

RELIANCE
LABORATORIES, INC.

175 MAY STREET, EDISON, NJ 08837 PH (732) 738-5454 FAX (732) 738-5841
EMAIL: 74201.3501@COMPUSERVE.COM

ANALYTICAL REPORT

For
Lyondell Chemical
Monaca, PA 15061

Project: Raccoon Creek

RELIANCE
LABORATORIES, INC.

175 MAY STREET, EDISON, NJ 08837 PH (732) 738-5454 FAX (732) 738-5841
EMAIL: 74201.3501@COMPUSERVE.COM

ANALYTICAL DATA REPORT

for

Lyondell Chemical
Monaca, PA 15061
Project: Raccoon Creek

Date Received: 4/29/99

Sample ID	Lab ID #
RC-ER-72-0499	R-6228.1
RC-EL-24-0499	R-6228.2
RC-ER-36-0499	R-6228.3
RC-EL-48-0499	R-6228.4
RC-EC-74-0499	R-6228.5
RC-EC-00-0499A	R-6228.6
RC-EC-00-0499	R-6228.7
RC-EC-38-0499	R-6228.8
Field Blank	R-6228.9
Trip Blank	R-6228.10

G. P. Kirpalani
Manager

GPK/vb

RELIANCE
LABORATORIES INC.

3090 WOODBRIDGE AVENUE, EDISON NJ 08837 PH (908) 738-5454 FAX (908) 738-5841

REDUCED LABORATORY DATA DELIVERABLES

		Check if Complete
I.	Cover Page, Format, and Laboratory Certification (Include Cross Reference Table of Field I.D. and Lab I.D)	✓
II.	Chain of Custody	✓
III.	Summary Sheets listing analytical results Including QA Data Information	✓
IV.	Laboratory Chronicle and Methodology	✓
V.	Initial Calibration and Continuing Calibration	✓
VI.	Tune Summary (MS)	✓
VII.	Blank Summary	✓
VIII.	Surrogate Recovery Summary	✓
IX.	Chromatograms / IR Spectra	✓
X.	Internal Standard Summary (MS)	✓
XI.	Matrix Spike / Spike Duplicate Summary	✓
XII.	Non-Conformance Summary	✓

GP Kurkalani
Laboratory Manager
Signature

5-12-99
Date

RELIANCE
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RELIANCE
LABORATORIES, INC.

175 MAY STREET, EDISON, NJ 08837 PH (732) 738-5454 FAX (732) 738-5841
EMAIL: 74201.3501@COMPUSERVE.COM

LABORATORY CHRONICLE

Customer Name Lyondell Chemical
Date Received: 4/29/99
Date Sampled: 4/27/99
Sample ID: As per chain of custody

Organic Extraction:

1 Acids _____
2 Base / Neutrals _____
3 Pesticides/PCB's _____
4 TPHC _____

Analysis:

1 Volatiles 4/29/99
2 Acids _____
3 Base/Neutrals _____
4 Pesticides/PCB's _____
5 TPHC _____

Inorganics:

1 Metals _____
2 Cyanides _____
3 Phenols _____

Other Analysis:

_____
_____

Supervisor
Review & Approval _____

GC/MS Analysis Conformance/Non-Conformance Summary Format

	NO	YES
1. Chromatograms Labeled/Compounds Identified (Field Samples and Method Blanks)	___	✓
2. GC/MS Tune Specifications		
a. BFB Meet Criteria	___	✓
b. DFTPP Meet Criteria	___	___
3. GC/MS Tuning Frequency - Performed every 24 hours for 600 series and 12 hours for 8000 series	___	✓
4. GC/MS Calibration - Initial Calibration performed within 30 days before sample analysis and continuing calibration performed within 24 hours of sample analysis for 600 series and 12 hours for 8000 series	___	✓
5. GC/MS Calibration Requirements		
a. Calibration Check Compounds (CCC)	___	✓
b. System Performance Check Compounds (SPCC)	___	✓
6. Blank Contamination - If yes, list compounds and concentrations in each blank:		
a. VOA Fraction _____		
b. B/N Fraction _____		
c. Acid Fraction _____		
7. Surrogate Recoveries Meet Criteria	___	✓
If not met, sample was diluted and reanalyzed	___	___
8. Matrix Spike/Matrix Spike Duplicate Recoveries Meet Criteria	___	✓
9. Internal Standard Area/Retention Time Shift Meet Criteria	___	✓
If not met, sample was diluted and reanalyzed	___	___
10. Extraction Holding Time Met	___	✓
If not met, list number of days exceeded for each sample: _____		
11. Analysis Holding Time Met	___	✓
If not met, list number of days exceeded for each sample:	___	___

Additional Comments: _____

Laboratory Manager: GP Kundalani Date: 5-12-94

R E L I A N C E
LABORATORIES INC.

175 MAY STREET, EDISON, NJ 08837 PH (732) 738-5454 FAX (732) 738-5841
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Method Summary for EPA method 624 & 8260 (VOA's)

An inert gas is bubbled through a 5mL sample (100 microliters of methanol soil extract in 5mL of pure water) in a specially designed sparge chamber at ambient temperature. The purgeable compounds are trapped in a sorbent column. Afetr purging is complete, the trapped volatiles are back-flushed in a megabore capillary GC/MS/Data System where they are identified and quantitated.

Instrumentation used consist of a Tekmar LSC-2000/ALS-2016 connected to a Hewlett Packard 5890 GC/ 5971A MSD.

Procedures and quality assurance are based on EPA Methods 624/8260 and TCLP.

R E L I A N C E
LABORATORIES INC.

175 MAY STREET, EDISON, NJ 08837 PH (732) 738-5454 FAX (732) 738-5841
EMAIL : 74201.3501@COMPUSERVE.COM

LABORATORY ID
NJ DEP NO. 12687
PA DER NO. 68437

CERTIFICATE OF ANALYSIS

Customer: Lyondell Chemical
Sample: Water Samples
Lab ID: R-6228
Reference: **Raccoon Creek**

30 April 1999

Units: µg/L

Sample ID	Benzene	Toluene	Ethylbenzene	Xylene	Styrene
RC-ER-72-0499	< 0.66	< 0.6	< 1.04	< 1.04	< 0.92
RC-EL-24-0499	< 0.66	< 0.6	< 1.04	< 1.04	< 0.92
RC-ER-36-0499	< 0.66	< 0.6	< 1.04	< 1.04	< 0.92
RC-EL-48-0499	< 0.66	< 0.6	< 1.04	< 1.04	< 0.92
RC-EC-74-0499	< 0.66	< 0.6	< 1.04	< 1.04	< 0.92
RC-EC-00-0499A	< 0.66	< 0.6	< 1.04	< 1.04	< 0.92
RC-EC-00-0499	< 0.66	< 0.6	< 1.04	< 1.04	< 0.92
RC-EC-38-0499	< 0.66	< 0.6	< 1.04	< 1.04	< 0.92
Field Blank	< 0.66	< 0.6	< 1.04	< 1.04	< 0.92
Trip Blank	< 0.66	< 0.6	< 1.04	< 1.04	< 0.92

G. P. Kirpalani
Manager

Quantitation Report

Data File : c:\hpchem\1\data\v6114.d
Acq On : 29 Apr 99 3:12 pm
Sample : R-6228.1
Misc : AHA - RC-ER-72-0499
Quant Time: Apr 30 9:51 1999

Vial: 4
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	10.95	168	1073938	50.00	ug/L	0.06
31) 1,4-Difluorobenzene	12.94	114	2378209	50.00	ug/L	0.06
40) Chlorobenzene-d5	21.74	117	1622461	50.00	ug/L	0.06
57) 1,4-Dichlorobenzene-d4	29.65	152	628322	50.00	ug/L	0.04
System Monitoring Compounds						%Recovery
26) Dibromofluoromethane	10.73	111	886446	52.57	ug/L	105.13%
39) Toluene-d8	17.24	98	2431727	51.88	ug/L	103.76%
58) 4-Bromofluorobenzene	25.71	95	869324	51.13	ug/L	102.26%
Target Compounds						Qvalue

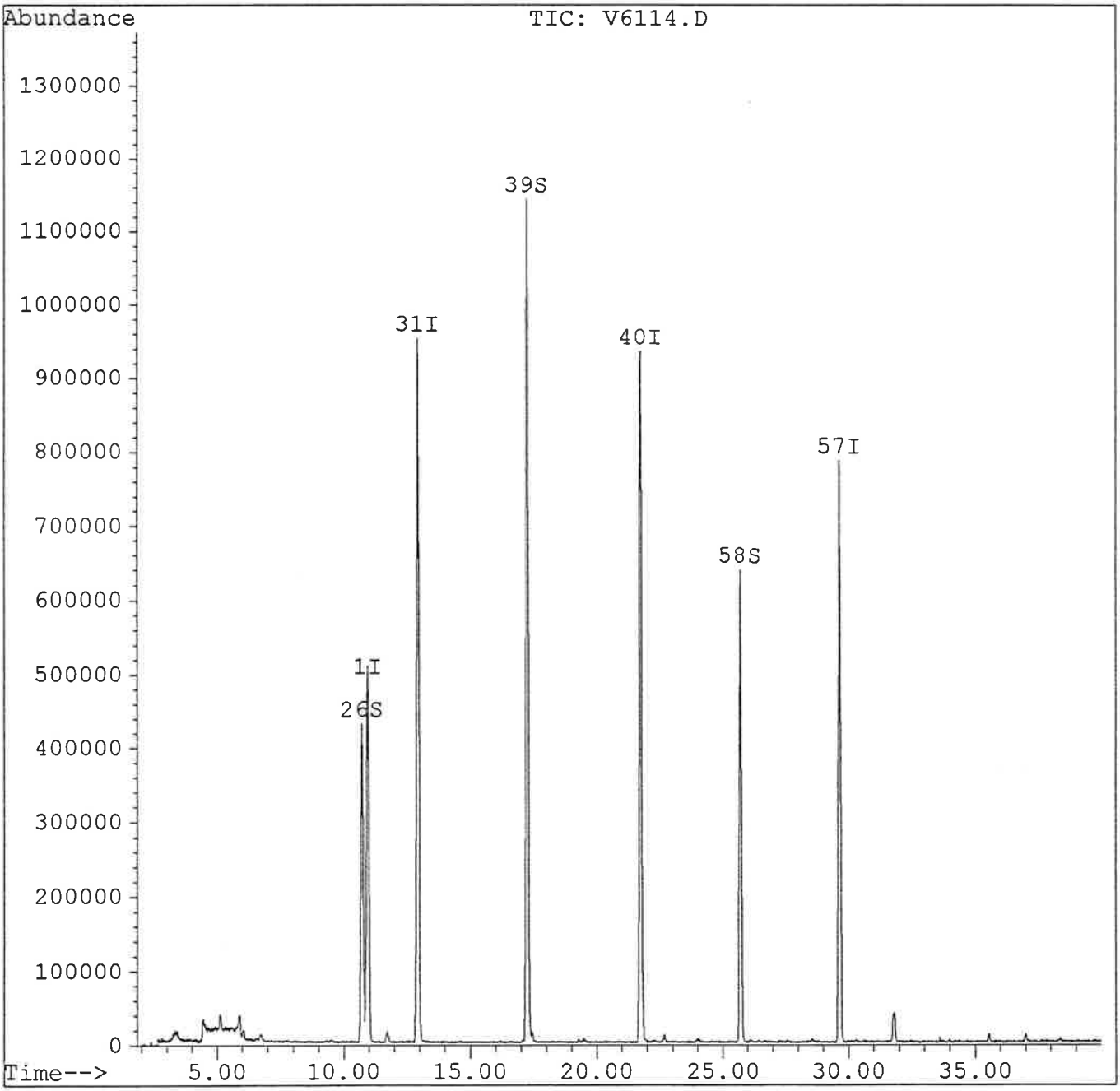
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : c:\hpchem\1\data\v6114.d
Acq On : 29 Apr 99 3:12 pm
Sample : R-6228.1
Misc : AHA - RC-ER-72-0499
Quant Time: Apr 30 9:51 1999

Vial: 4
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6115.D
Acq On : 29 Apr 99 4:03 pm
Sample : R-6228.2
Misc : AHA - RC-EL-24-0499
Quant Time: May 11 10:17 1999

Vial: 9
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	10.95	168	1035931	50.00	ug/L	0.06
31) 1,4-Difluorobenzene	12.94	114	2295526	50.00	ug/L	0.06
40) Chlorobenzene-d5	21.75	117	1554877	50.00	ug/L	0.06
57) 1,4-Dichlorobenzene-d4	29.66	152	616023	50.00	ug/L	0.05
System Monitoring Compounds						%Recovery
26) Dibromofluoromethane	10.73	111	840782	51.69	ug/L	103.37%
39) Toluene-d8	17.25	98	2343217	51.79	ug/L	103.59%
58) 4-Bromofluorobenzene	25.70	95	838572	50.30	ug/L	100.61%
Target Compounds						Qvalue

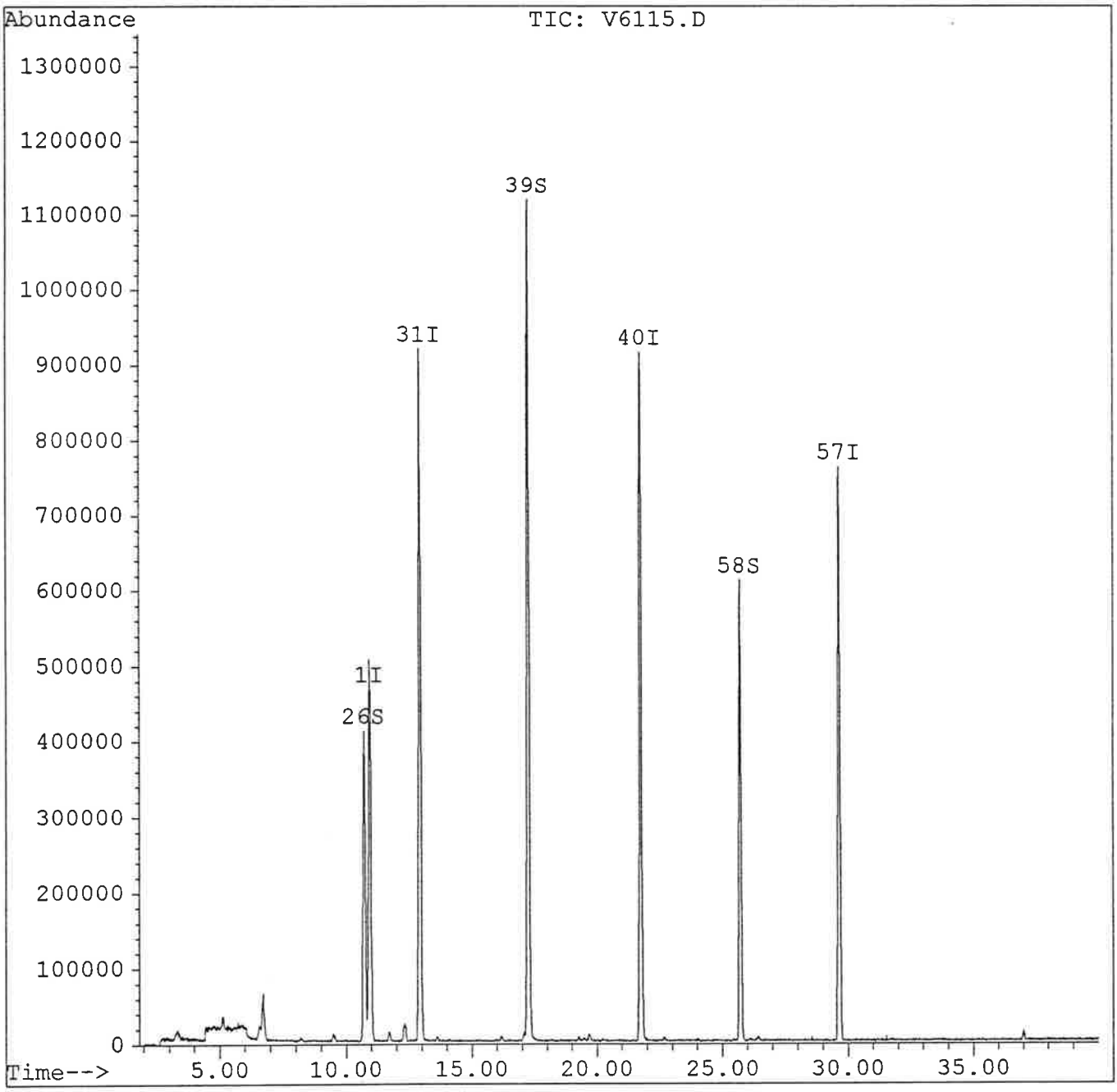
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6115.D
Acq On : 29 Apr 99 4:03 pm
Sample : R-6228.2
Misc : AHA - RC-EL-24-0499
Quant Time: May 11 10:17 1999

Vial: 9
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration

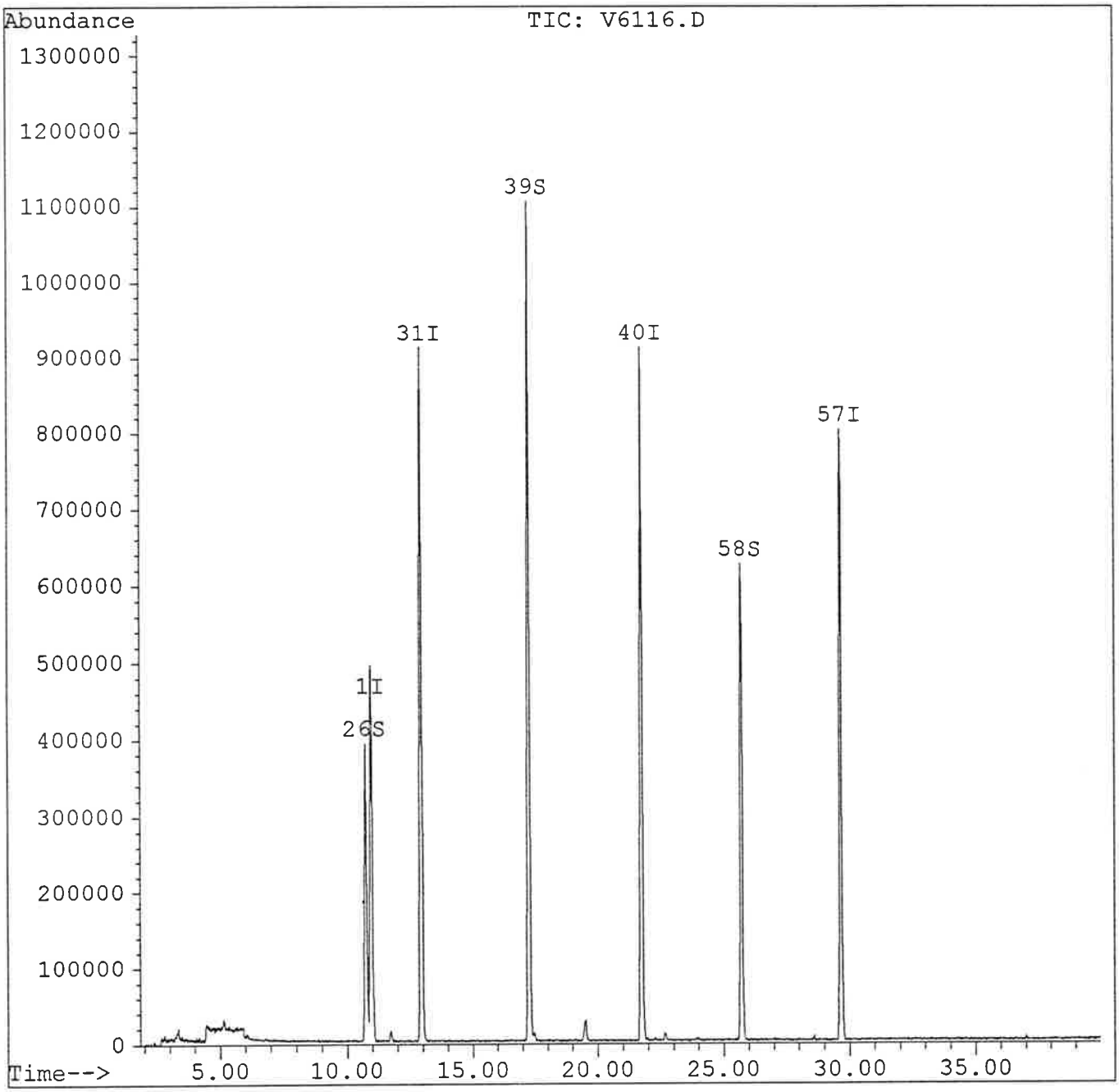


Quantitation Report

Data File : c:\hpchem\1\data\v6116.d
Acq On : 29 Apr 99 4:54 pm
Sample : R-6228.3
Misc : AHA - RC-ER-36-0499
Quant Time: Apr 30 9:51 1999

Vial: 10
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : c:\hpchem\1\data\v6117.d
Acq On : 29 Apr 99 5:44 pm
Sample : R-6228.4
Misc : AHA - RC-EL-48-0499
Quant Time: Apr 30 9:51 1999

Vial: 11
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	10.96	168	1111483	50.00	ug/L	0.07
31) 1,4-Difluorobenzene	12.95	114	2344884	50.00	ug/L	0.07
40) Chlorobenzene-d5	21.75	117	1648927	50.00	ug/L	0.06
57) 1,4-Dichlorobenzene-d4	29.66	152	688597	50.00	ug/L	0.05
System Monitoring Compounds						%Recovery
26) Dibromofluoromethane	10.73	111	809510	46.38	ug/L	92.76%
39) Toluene-d8	17.24	98	2394121	51.81	ug/L	103.61%
58) 4-Bromofluorobenzene	25.71	95	917934	49.26	ug/L	98.52%
Target Compounds						Qvalue

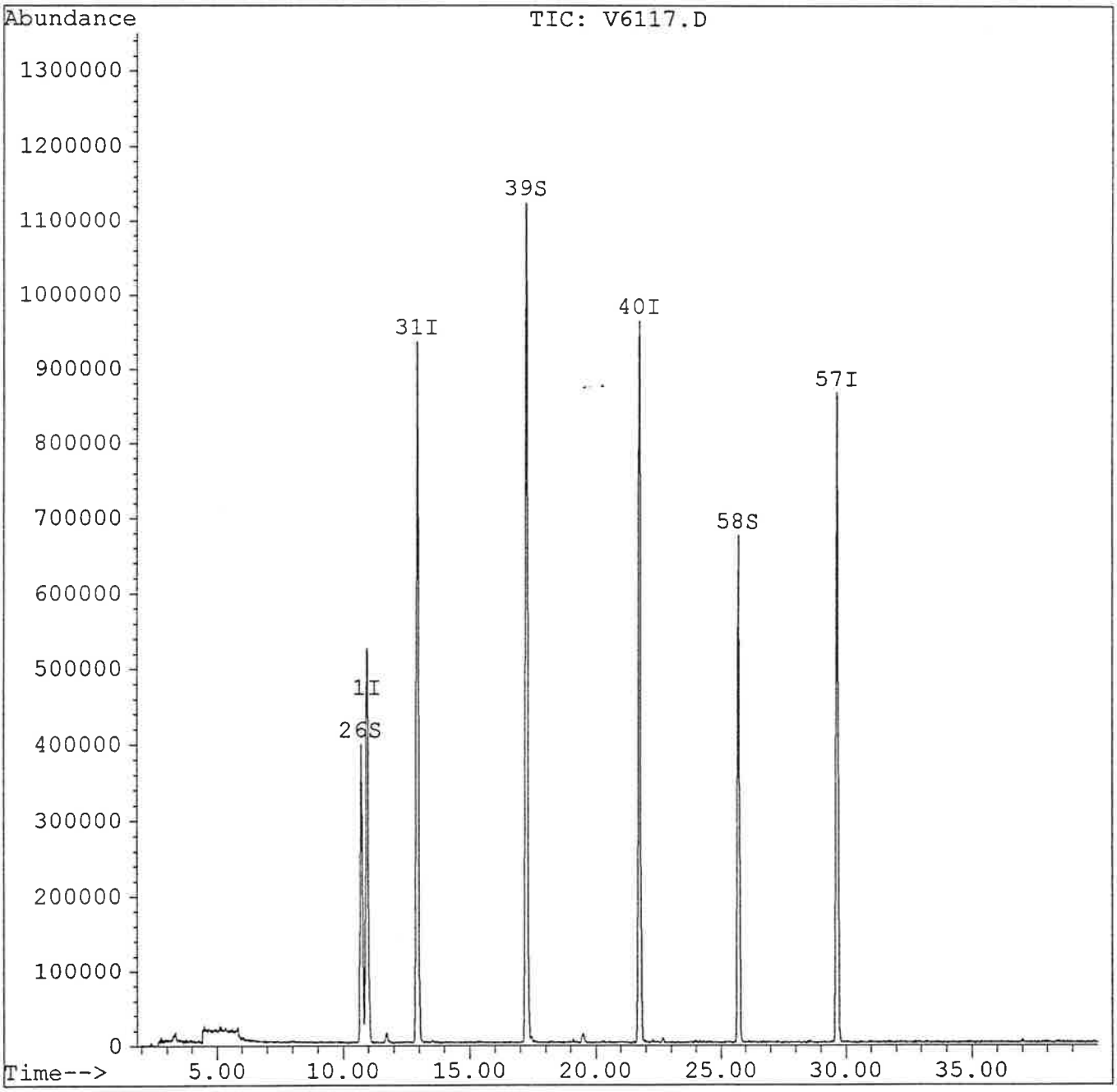
(#) = qualifier out of range (m) = manual integration
v6117.d 8260_RUN.M Tue May 11 10:06:38 1999

Quantitation Report

Data File : c:\hpchem\1\data\v6117.d
Acq On : 29 Apr 99 5:44 pm
Sample : R-6228.4
Misc : AHA - RC-EL-48-0499
Quant Time: Apr 30 9:51 1999

Vial: 11
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : c:\hpchem\1\data\v6118.d
Acq On : 29 Apr 99 6:34 pm
Sample : R-6228.5
Misc : AHA - RC-EC-74-0499
Quant Time: Apr 30 9:52 1999

Vial: 12
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	10.95	168	1035814	50.00	ug/L	0.06
31) 1,4-Difluorobenzene	12.94	114	2250352	50.00	ug/L	0.06
40) Chlorobenzene-d5	21.75	117	1530772	50.00	ug/L	0.06
57) 1,4-Dichlorobenzene-d4	29.65	152	594903	50.00	ug/L	0.04
System Monitoring Compounds						%Recovery
26) Dibromofluoromethane	10.73	111	826095	50.79	ug/L	101.58%
39) Toluene-d8	17.24	98	2275807	51.31	ug/L	102.63%
58) 4-Bromofluorobenzene	25.70	95	817516	50.78	ug/L	101.57%
Target Compounds						Qvalue

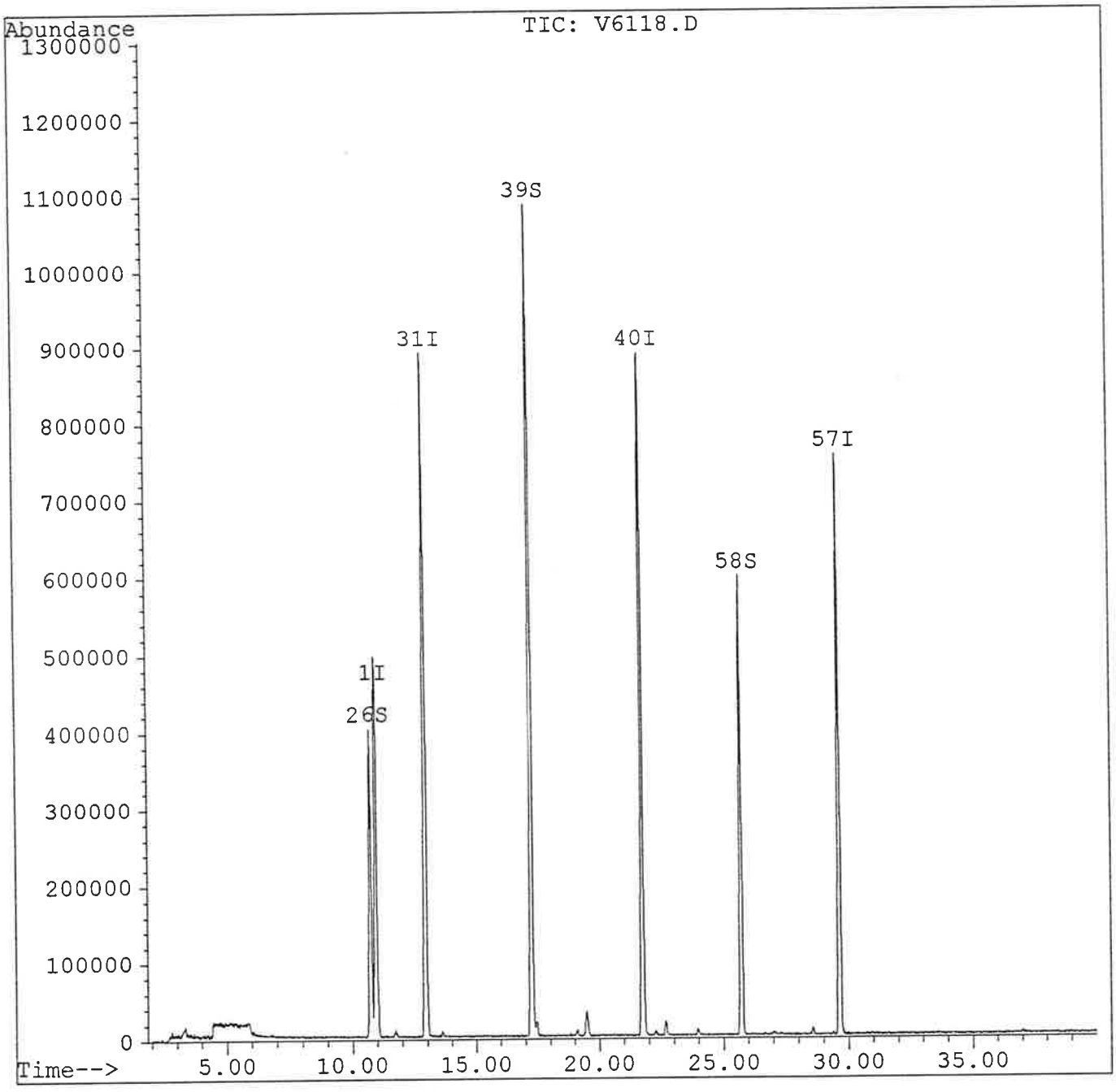
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : c:\hpchem\1\data\v6118.d
Acq On : 29 Apr 99 6:34 pm
Sample : R-6228.5
Misc : AHA - RC-EC-74-0499
Quant Time: Apr 30 9:52 1999

Vial: 12
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : c:\hpchem\1\data\v6119.d
Acq On : 29 Apr 99 7:24 pm
Sample : R-6228.6
Misc : AHA - RC-EC-00-0499A
Quant Time: Apr 30 9:52 1999

Vial: 13
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	10.95	168	1076991	50.00	ug/L	0.06
31) 1,4-Difluorobenzene	12.94	114	2378258	50.00	ug/L	0.06
40) Chlorobenzene-d5	21.74	117	1674646	50.00	ug/L	0.05
57) 1,4-Dichlorobenzene-d4	29.64	152	677610	50.00	ug/L	0.03
System Monitoring Compounds						%Recovery
26) Dibromofluoromethane	10.73	111	847707	50.13	ug/L	100.25%
39) Toluene-d8	17.24	98	2428495	51.81	ug/L	103.62%
58) 4-Bromofluorobenzene	25.70	95	915281	49.92	ug/L	99.83%
Target Compounds						Qvalue

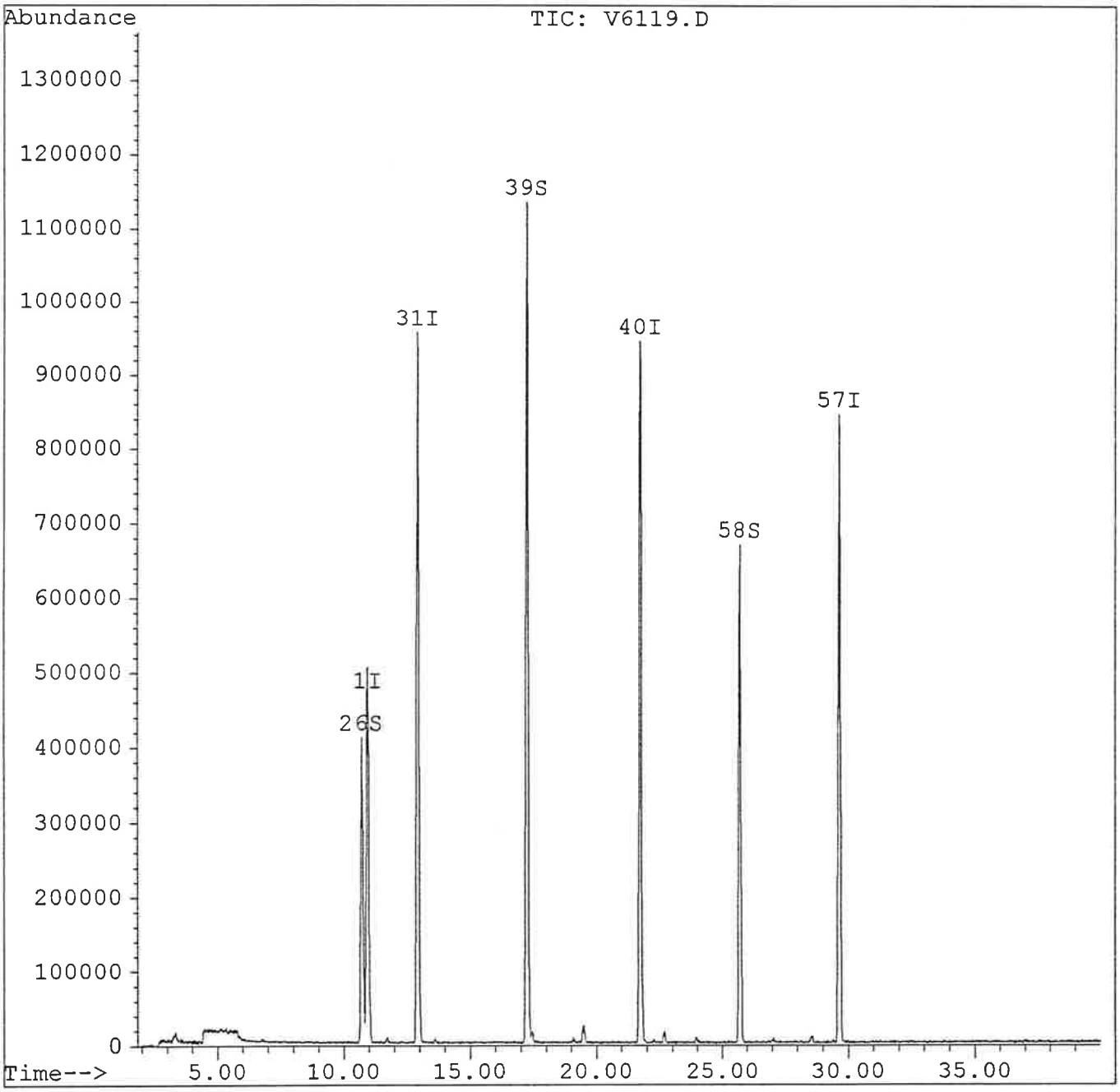
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : c:\hpchem\1\data\v6119.d
Acq On : 29 Apr 99 7:24 pm
Sample : R-6228.6
Misc : AHA - RC-EC-00-0499A
Quant Time: Apr 30 9:52 1999

Vial: 13
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration



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Quantitation Report

Data File : c:\hpchem\1\data\v6120.d
Acq On : 29 Apr 99 8:14 pm
Sample : R-6228.7
Misc : AHA - RC-EC-00-0499
Quant Time: Apr 30 9:52 1999

Vial: 14
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	10.96	168	1053008	50.00	ug/L	0.07
31) 1,4-Difluorobenzene	12.94	114	2338093	50.00	ug/L	0.06
40) Chlorobenzene-d5	21.74	117	1667274	50.00	ug/L	0.05
57) 1,4-Dichlorobenzene-d4	29.65	152	672915	50.00	ug/L	0.05
System Monitoring Compounds						%Recovery
26) Dibromofluoromethane	10.73	111	822679	49.75	ug/L	99.51%
39) Toluene-d8	17.24	98	2383644	51.73	ug/L	103.46%
58) 4-Bromofluorobenzene	25.70	95	912474	50.11	ug/L	100.22%
Target Compounds						Qvalue

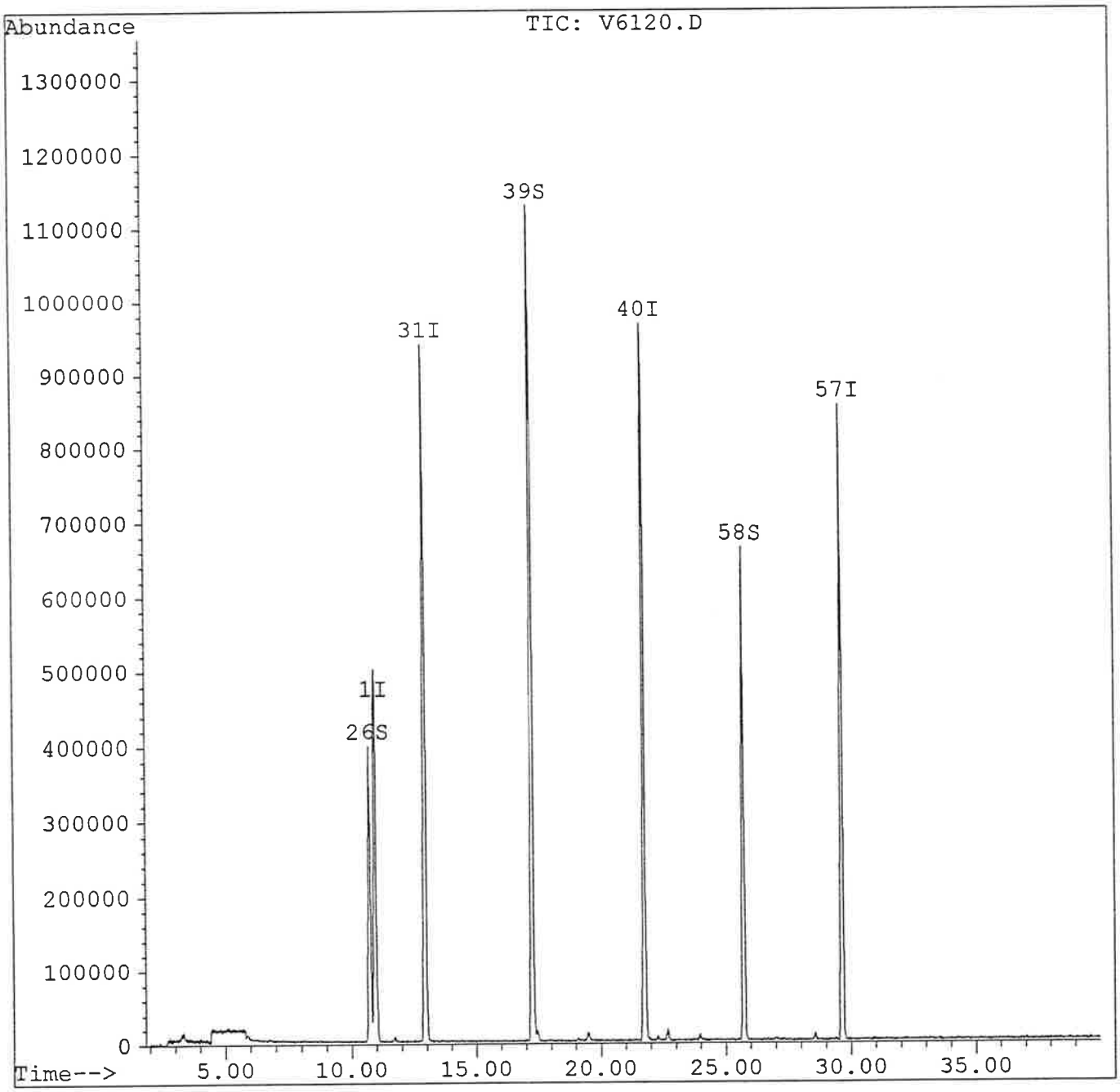
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : c:\hpchem\1\data\v6120.d
Acq On : 29 Apr 99 8:14 pm
Sample : R-6228.7
Misc : AHA - RC-EC-00-0499
Quant Time: Apr 30 9:52 1999

Vial: 14
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : c:\hpchem\1\data\v6121.d
Acq On : 29 Apr 99 9:03 pm
Sample : R-6228.8
Misc : AHA - RC-EC-38-0499
Quant Time: Apr 30 9:52 1999

Vial: 15
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	10.96	168	990698	50.00	ug/L	0.07
31) 1,4-Difluorobenzene	12.94	114	2214403	50.00	ug/L	0.06
40) Chlorobenzene-d5	21.74	117	1550413	50.00	ug/L	0.05
57) 1,4-Dichlorobenzene-d4	29.65	152	591268	50.00	ug/L	0.04
System Monitoring Compounds						%Recovery
26) Dibromofluoromethane	10.73	111	795608	51.14	ug/L	102.29%
39) Toluene-d8	17.24	98	2240111	51.33	ug/L	102.66%
58) 4-Bromofluorobenzene	25.70	95	817524	51.10	ug/L	102.19%
Target Compounds						Qvalue

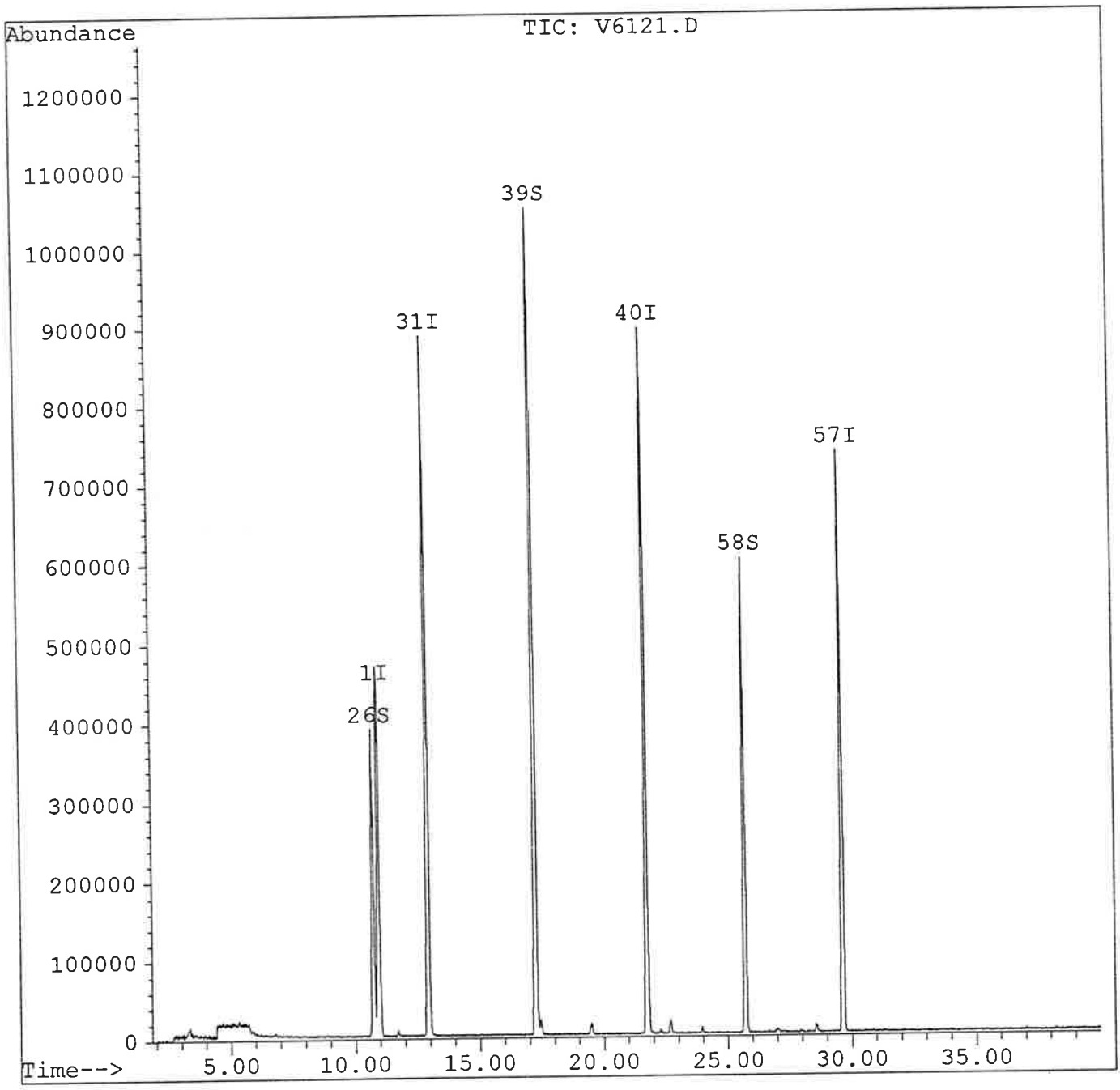
(#) = qualifier out of range (m) = manual integration
v6121.d 8260_RUN.M Tue May 11 10:07:22 1999

Quantitation Report

Data File : c:\hpchem\1\data\v6121.d
Acq On : 29 Apr 99 9:03 pm
Sample : R-6228.8
Misc : AHA - RC-EC-38-0499
Quant Time: Apr 30 9:52 1999

Vial: 15
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : c:\hpchem\1\data\v6122.d
Acq On : 29 Apr 99 9:53 pm
Sample : R-6228.9
Misc : AHA - Field Blank
Quant Time: Apr 30 9:53 1999

Vial: 16
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	10.95	168	1023922	50.00	ug/L	0.06
31) 1,4-Difluorobenzene	12.94	114	2328360	50.00	ug/L	0.06
40) Chlorobenzene-d5	21.74	117	1631722	50.00	ug/L	0.05
57) 1,4-Dichlorobenzene-d4	29.65	152	632822	50.00	ug/L	0.04
System Monitoring Compounds						%Recovery
26) Dibromofluoromethane	10.73	111	784459	48.79	ug/L	97.58%
39) Toluene-d8	17.24	98	2354961	51.32	ug/L	102.64%
58) 4-Bromofluorobenzene	25.71	95	866514	50.60	ug/L	101.20%
Target Compounds						Qvalue

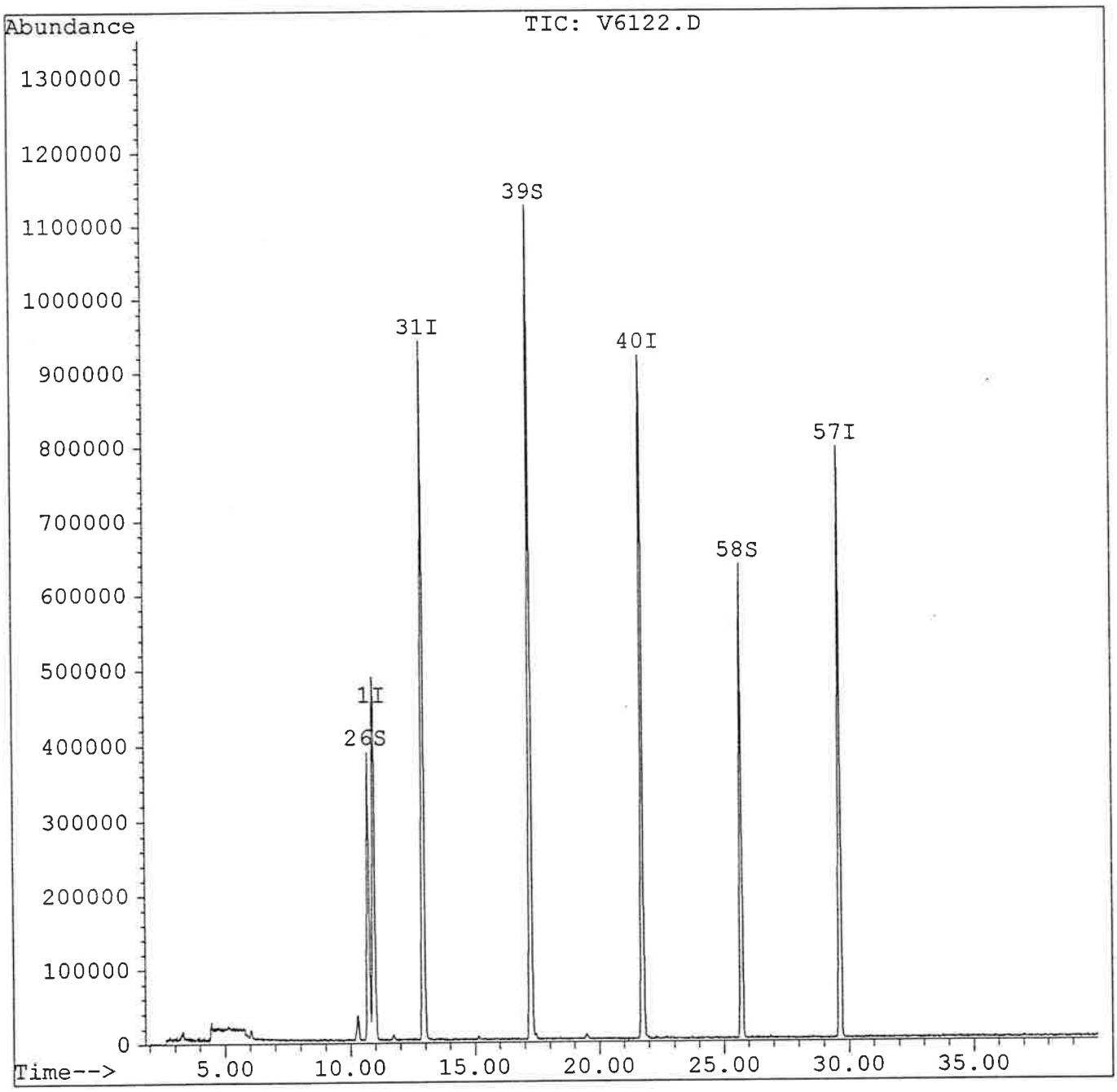
(#) = qualifier out of range (m) = manual integration
v6122.d 8260_RUN.M Tue May 11 10:07:35 1999

Quantitation Report

Data File : c:\hpchem\1\data\v6122.d
Acq On : 29 Apr 99 9:53 pm
Sample : R-6228.9
Misc : AHA - Field Blank
Quant Time: Apr 30 9:53 1999

Vial: 16
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration



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Quantitation Report

Data File : c:\hpchem\1\data\v6123.d
Acq On : 29 Apr 99 10:43 pm
Sample : R-6228.10
Misc : AHA - Trip Blank
Quant Time: Apr 30 9:53 1999

Vial: 1
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	10.95	168	1090599	50.00	ug/L	0.06
31) 1,4-Difluorobenzene	12.94	114	2465238	50.00	ug/L	0.06
40) Chlorobenzene-d5	21.74	117	1742209	50.00	ug/L	0.05
57) 1,4-Dichlorobenzene-d4	29.65	152	689855	50.00	ug/L	0.04
System Monitoring Compounds						**%Recovery**
26) Dibromofluoromethane	10.73	111	824654	48.15	ug/L	96.31%
39) Toluene-d8	17.24	98	2491921	51.29	ug/L	102.58%
58) 4-Bromofluorobenzene	25.70	95	957959	51.32	ug/L	102.63%
Target Compounds						**Qvalue**

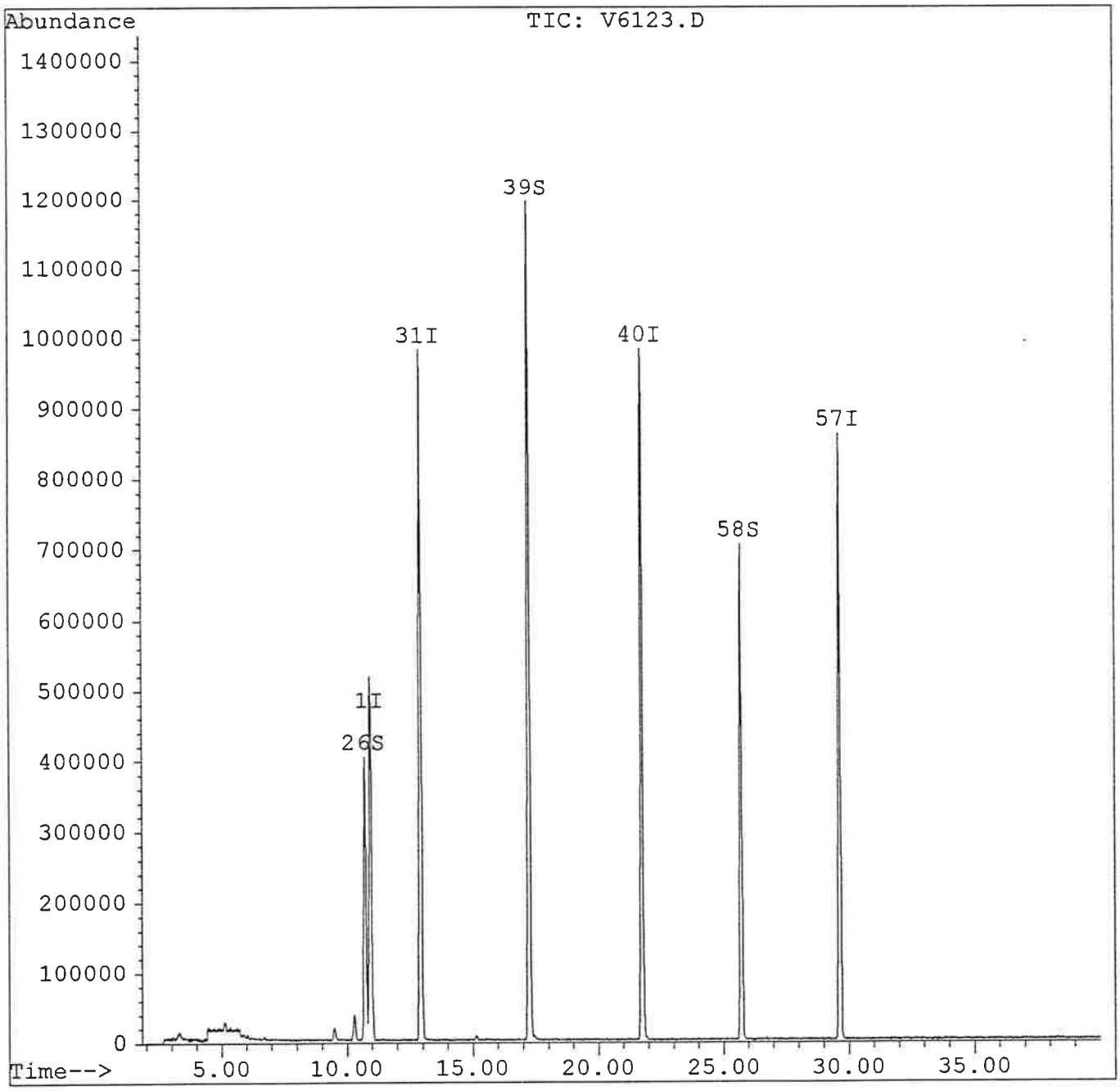
(#) = qualifier out of range (m) = manual integration
v6123.d 8260_RUN.M Tue May 11 10:07:49 1999

Quantitation Report

Data File : c:\hpchem\1\data\v6123.d
Acq On : 29 Apr 99 10:43 pm
Sample : R-6228.10
Misc : AHA - Trip Blank
Quant Time: Apr 30 9:53 1999

Vial: 1
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration



RELIANCE LABORATORIES, INC.

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Customer : Lyondell

	SAMPLE NO.	SMC1 #	SMC2 #	SMC3 #	OTHER #	TOT OUT
01	VBLK01	98	103	104		
02	R-6228.1	105	104	102		
03	R-6228.2	103	104	101		
04	R-6228.3	97	104	99		
05	R-6228.4	93	104	99		
06	R-6228.5	102	103	102		
07	R-6228.6	100	104	100		
08	R-6228.7	100	103	100		
09	R-6228.8	102	103	102		
10	R-6228.9	98	103	101		
11	R-6228.10	96	103	103		
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

		QC LIMITS
SMC1	= Dibromofluoromethane	(70-121)
SMC2	= Toluene-d8	(81-117)
SMC3	= 4-Bromofluorobenzene	(74-121)

\# Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM II VOA-1

RELIANCE LABORATORIES

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Customer: Lyondell

Matrix Spike - Sample No.: R-8228.3

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Benzene	30	0	36	119	(59-172)
Toluene	30	0	36	120	(66-142)
Ethylbenzene	30	0	36	120	(62-137)
o-xylenes	30	0	36	121	(59-139)
Styrene	30	0	35	117	(60-133)

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MS % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	30	37	123	3	22	(59-172)
Toluene	30	36	118	2	21	(66-142)
Ethylbenzene	30	35	117	3	24	(62-137)
o-xylenes	30	35	116	4	21	(59-139)
Styrene	30	35	116	2	21	(60-133)

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

Comments: _____

_____

RELIANCE LABORATORIES, INC.

VOLATILE METHOD BLANK SUMMARY

VBLK0

Customer : Lyondell

Lab File ID V6113.D

Lab Sample ID: BLANK01

Date Analyzed: 4/29/99

Time Analyzed: 1421

GC Column: DB-624 ID: 0.53 (mm)

Instrument ID: HP5971

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	R-6228.1	ER-72	V6114.D	1512
02	R-6228.2	EL-24	V6115.D	1603
03	R-6228.3	ER-36	V6116.D	1654
04	R-6228.4	EL-48	V6117.D	1744
05	R-6228.5	EC-74	V6118.D	1834
06	R-6228.6	EC-00-A	V6119.D	1924
07	R-6228.7	EC-00	V6120.D	2014
08	R-6228.8	EC-38	V6121.D	2103
09	R-6228.9	FBLANK	V6122.D	2153
10	R-6228.10	TBLANK	V6123.D	2243
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM IV VOA

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6113.D
Acq On : 29 Apr 99 2:21 pm
Sample : blank
Misc : blank
Quant Time: May 11 10:11 1999

Vial: 3
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	10.96	168	1063922	50.00	ug/L	0.07
31) 1,4-Difluorobenzene	12.96	114	2329366	50.00	ug/L	0.07
40) Chlorobenzene-d5	21.75	117	1599487	50.00	ug/L	0.06
57) 1,4-Dichlorobenzene-d4	29.66	152	610647	50.00	ug/L	0.05
System Monitoring Compounds						%Recovery
26) Dibromofluoromethane	10.73	111	815869	48.84	ug/L	97.67%
39) Toluene-d8	17.25	98	2358299	51.37	ug/L	102.74%
58) 4-Bromofluorobenzene	25.71	95	856047	51.81	ug/L	103.61%
Target Compounds						Qvalue

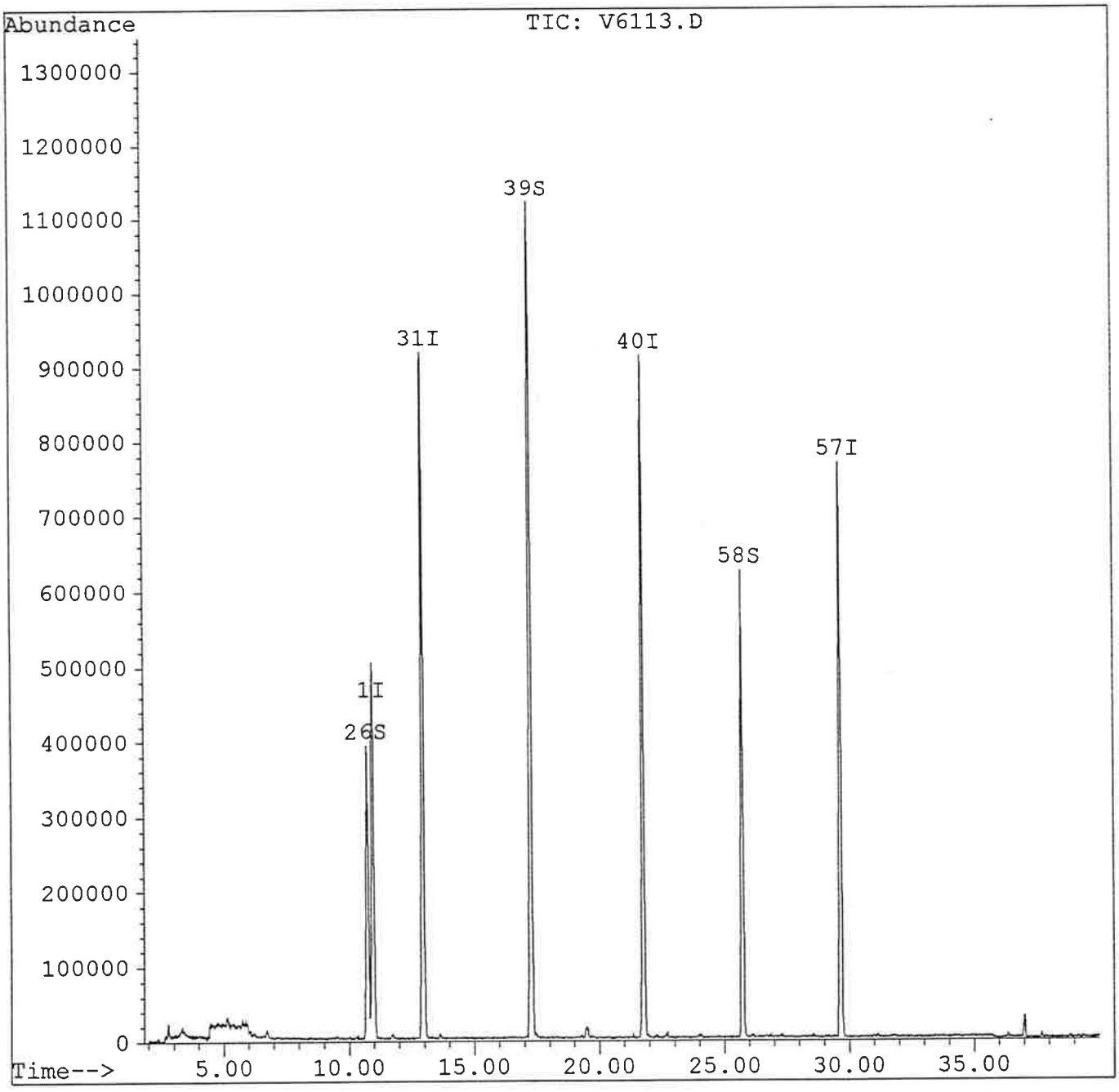
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6113.D
Acq On : 29 Apr 99 2:21 pm
Sample : blank
Misc : blank
Quant Time: May 11 10:11 1999

Vial: 3
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics
Last Update : Thu Apr 29 14:22:46 1999
Response via : Multiple Level Calibration



RELIANCE LABORATORIES, INC.

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Customer : Lyondell

Lab File ID: V6107.D

BFB Injection Date: 4/29/99

Instrument ID: HP5971A

BFB Injection Time: 0856

GC Column: DB-624 ID: 0.53 (mm)

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	22.9
75	30.0 - 66.0% of mass 95	45.5
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.3
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	66.3
175	4.0 - 9.0% of mass 174	5.8 (8.7)1
176	93.0 - 101.0% of mass 174	63.4 (95.5)1
177	5.0 - 9.0% of mass 176	4.0 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD150	ICC150	V6108.D	4/29/99	0929
02	VSTD050	ICC050	V6109.D	4/29/99	1019
03	VSTD020	ICC020	V6110.D	4/29/99	1109
04	VSTD100	ICC100	V6111.D	4/29/99	1159
05	VSTD200	ICC200	V6112.D	4/29/99	1250
06	VBLK01	BLANK01	V6113.D	4/29/99	1421
07	R-6228.1	ER-72	V6114.D	4/29/99	1512
08	R-6228.2	EL-24	V6115.D	4/29/99	1603
09	R-6228.3	ER-36	V6116.D	4/29/99	1654
10	R-6228.4	EL-48	V6117.D	4/29/99	1744
11	R-6228.5	EC-74	V6118.D	4/29/99	1834
12	R-6228.6	EC-00-A	V6119.D	4/29/99	1924
13	R-6228.7	EC-00	V6120.D	4/29/99	2014
14	R-6228.8	EC-38	V6121.D	4/29/99	2103
15	R-6228.9	FBLANK	V6122.D	4/29/99	2153
16	R-6228.10	TBLANK	V6123.D	4/29/99	2243
17					
18					
19					
20					
21					
22					

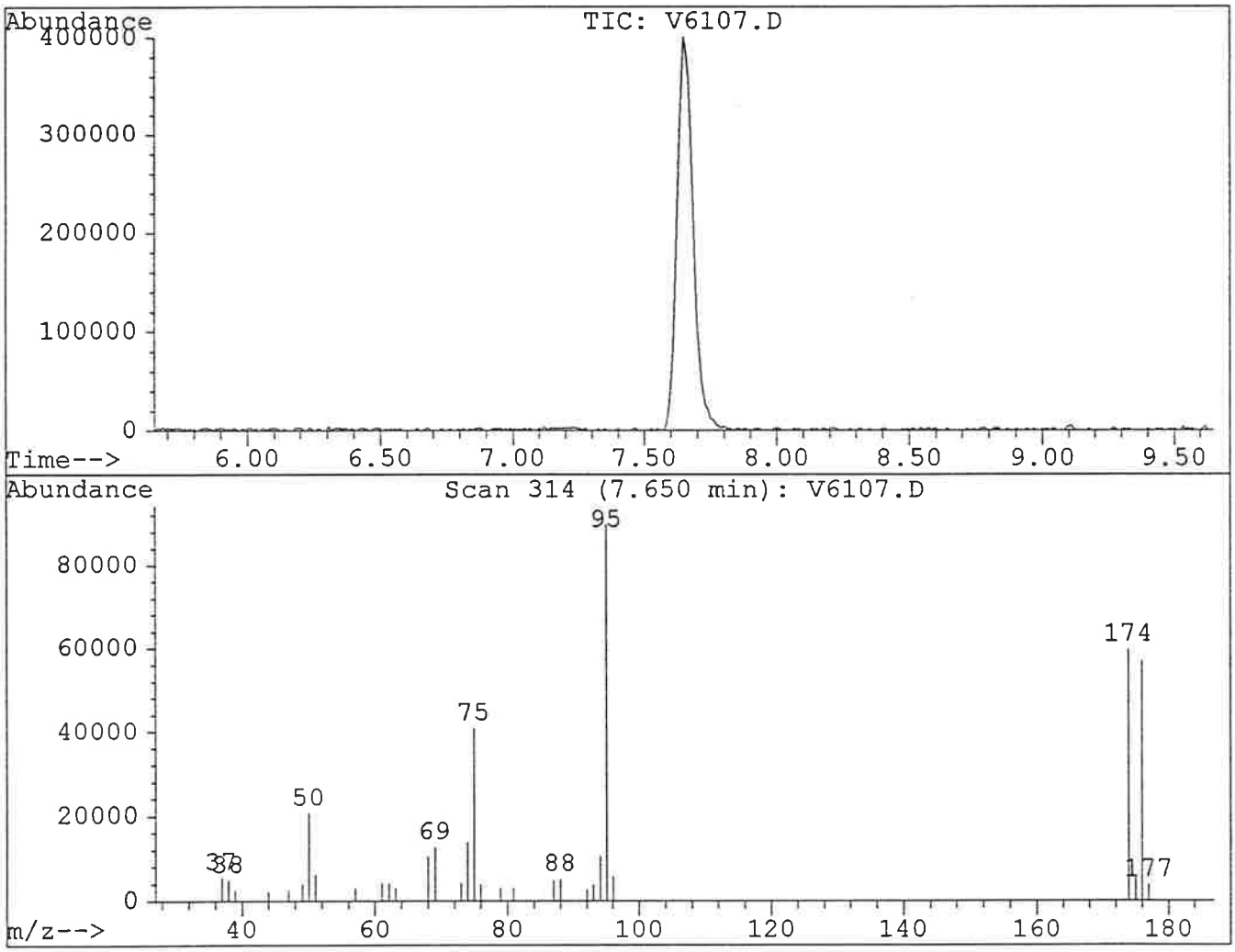
FORM V VOA

BFB

Data File : C:\HPCHEM\1\DATA\V6107.D
Acq On : 29 Apr 99 8:56 am
Sample : bfb
Misc :

Vial: 1
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260_RUN.M
Title : 524.2 & 8260 Purgable Organics



Peak Apex is scan: 314

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	22.9	20608	PASS
75	95	30	80	45.5	40888	PASS
95	95	100	100	100.0	89936	PASS
96	95	5	9	6.3	5690	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	66.3	59672	PASS
175	174	5	9	8.7	5213	PASS
176	174	95	101	95.5	56984	PASS
177	176	5	9	6.4	3630	PASS

V6107.D 8260_RUN.M Tue May 11 10:15:08 1999

RELIANCE LABORATORIES, INC.

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Customer: Lyondell

Instrument ID: HP5971A Calibration Date(s): 4/29/99 4/29/99

Calibration Times: 0929 1250

GC Column: DB-624 ID: 0.53 (mm)

Lab File ID:
RRF100 = V6111.D
RRF20 = V6110.D
RRF150 = V6108.D
RRF50 = V6109.D
RRF200 = V6112.D

COMPOUND	RRF20	RRF50	RRF100	RRF150	RRF200	$\overline{RRF}$	% RSD
Benzene	3.720	3.852	3.703	3.420	3.282	3.595	6.6
Toluene	2.346	2.261	2.252	2.082	2.070	2.202	5.5
Ethylbenzene	2.556	2.486	2.517	2.298	2.297	2.431	5.1
m&p-xylenes	0.889	0.874	0.895	0.827	0.812	0.859	4.4
o-xylene	1.880	1.826	1.861	1.683	1.668	1.784	5.6
Styrene	1.478	1.423	1.483	1.308	1.346	1.407	5.6
Dibromofluoromethane	0.796	0.782	0.801	0.732	0.815	0.785	4.1
Toluene-d8	0.994	0.974	1.000	0.979	0.981	0.985	1.1
4-Bromofluorobenzene	1.358	1.364	1.334	1.353	1.356	1.353	0.9

* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

FORM VI VOA

RELIANCE LABORATORIES, INC.

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Customer : Lyondell

Lab File ID (Standard): V6109.D

Date Analyzed: 4/29/99

Instrument ID: HP5971A

Time Analyzed: 1019

GC Column: DB-624 ID: 0.53 (mm)

		IS1 AREA #	RT #	IS2 AREA #	RT #	IS3 AREA #	RT #
	12 HOUR STD	1135431	10.94	2493803	12.94	1693043	21.73
	UPPER LIMIT	2270862	11.44	4987606	13.44	3386086	22.23
	LOWER LIMIT	567716	10.44	1246902	12.44	846522	21.23
	SAMPLE NO.						
01	VBLK01	1063922	10.96	2329366	12.96	1599487	21.75
02	R-6228.1	1073938	10.95	2378209	12.94	1622461	21.74
03	R-6228.2	1035931	10.95	2295526	12.94	1554877	21.75
04	R-6228.3	1049884	10.96	2296027	12.95	1553892	21.75
05	R-6228.4	1111483	10.96	2344884	12.95	1648927	21.75
06	R-6228.5	1035814	10.95	2250352	12.94	1530772	21.75
07	R-6228.6	1076991	10.95	2378258	12.94	1674646	21.74
08	R-6228.7	1053008	10.96	2338093	12.94	1667274	21.74
09	R-6228.8	990698	10.96	2214403	12.94	1550413	21.74
10	R-6228.9	1023922	10.95	2328360	12.94	1631722	21.74
11	R-6228.10	1090599	10.95	2465238	12.94	1742209	21.74
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 = Pentafluorobenzene
IS2 = 1,4-Difluorobenzene
IS3 = Chlorobenzene-d5

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

RELIANCE LABORATORIES, INC.

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Customer : Lyondell

Lab File ID (Standard): V6109.D Date Analyzed: 4/29/99

Instrument ID: HP5971A Time Analyzed: 1019

GC Column: DB-624 ID: 0.53 (mm)

		IS4 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	652532	29.65				
	UPPER LIMIT	1305064	30.15				
	LOWER LIMIT	326266	29.15				
	SAMPLE NO.						
01	VBLK01	610647	29.66				
02	R-6228.1	628322	29.65				
03	R-6228.2	616023	29.66				
04	R-6228.3	638415	29.66				
05	R-6228.4	688597	29.66				
06	R-6228.5	594903	29.65				
07	R-6228.6	677610	29.64				
08	R-6228.7	672915	29.65				
09	R-6228.8	591268	29.65				
10	R-6228.9	632822	29.65				
11	R-6228.10	689855	29.65				
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS4 = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

FORM VIII VOA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certifies That

Reliance Laboratories, Inc.
3090 Wood Bridge Avenue
Edison, NJ 08837

having duly met the requirements of the

Regulations Governing Laboratory Certification
And Standards Of Performance N.J.A.C. 7:18 et. seq.

is hereby approved as a

State Certified Water Laboratory

To perform the analyses as indicated on the Annual Certified Parameter List which must accompany this certificate to be valid

12687
PERMANENT CERTIFICATION NUMBER

January 11, 1989
DATE

ACTING COMMISSIONER
DEPARTMENT OF ENVIRONMENTAL PROTECTION

This certification is subject to unannounced laboratory inspections as specified by N.J.A.C. 7:18-2.11(d) and agreed to by the Laboratory Manager on filing the application

TO BE CONSPICUOUSLY DISPLAYED AT THE LABORATORY WITH THE ANNUAL CERTIFIED PARAMETER LIST.

CHAIN OF CUSTODY

CUSTOMER: Lyondell Chemical
ADDRESS: 400 Frankfort Road
Monaca, PA 15061
PHONE (724) 728-6582
FAX (724) 728-6498

Reliance Laboratories, Inc.
175 May Street
Edison, NJ 08837
Tel. 732-738-5454 / Fax. 732-738-5841

DATE: 4/27/99
LAB ID: R-6228
Project ID:
Turnaround time: standard (standard / ~~rush~~)
Fax results: (Y) / n (724) 728 6498

Sampler Name: BDP
Preserved: Y (N)
Sample Intact: (Y) / n

SAMPLE ID	Date Spld.	Time	# of containers	MATRIX: Water	Soil	Other	ORGANICS: BTEX (602/8020)	TPH (418.1)	VOA (624/8260) +15 *	BNA / BN / + 25 *	Pest / Herb	PCB's	TCLP Organics / PP +40	Other --	METALS: TCLP/ RCRA (8)	Priority Pol.(13)	Total Metals (list below)	Dissolved Metals	Other-	OTHERS: pH / CN / Sulfide *	Flpt / % solids *	O & G / TSS / TOX *	BOD / COD / TOC *				Notes:
RC-ER-72-0499	4/27/99	12:45	1	✓			✓																			
RC-EL-24-0499	4/27/99	12:45	1	✓			✓																			
RC-ER-36-0499	4/27/99	12:45	1	✓			✓																			
RC-EL-48-0499	4/27/99	12:45	1	✓			✓																			
RC-EC-74-0499	4/27/99	12:45	1	✓			✓																			
RC-EC-00-0499A	4/27/99	12:45	1	✓			✓																			
RC-EC-00-0499	4/27/99	12:45	1	✓			✓																			
RC-EC-38-0499	4/27/99	12:45	1	✓			✓																			
Field Blank	4/27/99	12:45	1	✓			✓																			
Trip Blank	4/27/99	12:45	1	✓			✓																			

* circle

Instructions: Please fax Results to Dave Smallwood 1-610-565-3583 and Skip Maier 1 303-873-6110

Submitted by:	Submitted by:	Submitted by:	Report to:
BDP			
Agent of: AHA	Agent of:	Agent of:	Deliverables:
Received by:	Received by:	Received by:	☐ Standard
Agent of: RELIANCE LABS	Agent of:	Agent of:	☐ Reduced
Date/Time: 4-27-99	Date/Time:	Date/Time:	☐ Customized